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Journal of the Society of Arts.

FRIDAY, SEPTEMBER 9, 1859.

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EXAMINATIONS, 1859.

The Prizes and Certificates awarded at the Society's Examinations, held in May last, have been forwarded to the Local Boards for distribution among the successful candidates.

BRITISH ASSOCIATION MEETING.

The Great Northern and London and North Western Railway Companies have agreed to issue first-class return tickets at £5 each, from King's-cross or Euston-square to Aberdeen and back, available from Monday, the 12th, till Friday, the 30th inst., inclusive, to persons presenting a card issued by the authorities of the British Association, and which may be obtained of Messrs. Taylor and Francis, Red Lion-court, Fleet-street. Passengers holding these tickets will be allowed to stop one night on the journey, under the same regulations as ordinary first-class passengers.

EXAMINATION PAPERS, 1859.

(*Concluded from page* 660.)

The following are the Examination Papers set in the various subjects at the Society's Final Examinations, held in May last:—

LATIN AND ROMAN HISTORY.

THREE HOURS ALLOWED.

Candidates are not allowed to work more than *two* out of the *four* Sections into which this Paper is divided, and are not expected to answer more than six questions in Section III. or IV.

SECTION I.

Translate literally into English prose:—

Itaque Hannibal, postquam ipsi sententia stetit pergere ire atque Italiam petere, advocata concione varie militum versat animos castigando adhortandoque: mirari se, quinam pectora semper impavida repens terror invaserit; per tot annos vincentes eos stipendia facere, neque ante Hispania excessisse quam omnes gentesque et terrae eae, quas duo diversa maria amplectantur, Carthaginiensium essent. indignatos deinde, quod quicumque Saguntum obsedissent, velut ob noxam sibi dedi postularet populus Romanus, Hiberum trajecisse ad delendum nomen Romanorum liberandumque orbem terrarum. tum nemini visum id longum, cum ab occasu solis ad ortum intenderent iter: nunc, postquam multo majorem partem itineris emensam cernant, Pyrenaeum saltum inter ferocissimas gentes superatum, Rhodanum tantum amnem tot milibus Gallorum prohibentibus domita etiam ipsius fluminis vi trajectum, in conspectu Alpes habeant, quarum alterum latus Italiae sit, in ipsis portis hostium fatigatos subsistere — quid Alpes aliud esse credentes quam montium altitudines? fingerent altiores Pyrenaei jugis; nullas profecto terras caelum contingere nec inexsuperabiles humano generi esse; Alpes quidem habitari, coli, gignere atque alere animantes; pervias paucis esse et exercitibus. eos ipsos, quos cernant, legatos non pinnis sublime elatos Alpes transgressos. ne majores quidem eorum indigenas, sed advenas Italiae cultores has ipsas Alpes ingentibus saepe agminibus cum liberis ac conjugibus migrantium modo tuto transmisisse.

(1.) Parse fully ipsi—concione—Carthaginiensium—trajecisse—prohibentibus—fingerent—elatos.

(2.) Why is amplectantur in the subjunctive mood? Are there any other verbs in the passage put in the subjunctive mood for the same reason?

(3.) Explain the phrases stipendia facere—ob noxam.

(4.) Give a brief abstract of the causes of the war and of its progress up to this point.

SECTION II.

Translate into English prose:—

Sic animis juvenum furor additus: inde, lupi ceu
Raptores atra in nebula, quos improba ventris
Exegit caecos rabies, catulique relicti
Faucibus exspectant siccis, per tela, per hostes
Vadimus haud dubiam in mortem, mediaeque tenemus
Urbis iter. Nox atra cava circumvolat umbra.
Quis cladem illius noctis, quis funera fando
Explicet, aut possit lacrimis aequare labores?
Urbs antiqua ruit, multos dominata per annos;
Plurima perque vias sternuntur inertia passim
Corpora perque domos et religiosa deorum
Limina. Nec soli poenas dant sanguine Teucri;
Quondam etiam victis redit in praecordia virtus,
Victoresque cadunt Danai. Crudelis ubique
Luctus, ubique pavor et plurima mortis imago.

(1.) Pars fully animis—cœcos—faucibus—fando—lacrimis—victis.

(2.) Explain mediæ urbis. What other adjectives besides medius are used in the same way?

(3.) Conjugate exegit, tenemus, explicet, sternuntur, dant, cadunt.

(,4.) Give the genitive singular of furor, rabies, mortem, ter nox, inertia, corpora, soli, præcordia, imago.

SECTION III.

(1.) Explain the nature and powers of the Comitia Curiata, Centuriata, and Tributa.

(2.) Give an account of Genucius, Terentilius, Publilius, and Licinius.

(3.) What was the object of the first Decemvirate and what of the second? Give an account of the circumstances which led to the abolition of the latter.

(4.) Explain the nature of the Agrarian Laws.

(5.) Give an account of the first Punic war.

(6.) Give an outline of the successive steps by which the Romans became masters of all Italy.

(7.) What are the duties and the powers of a Consul, a Censor, a Prætor, a Quæstor, and a Curule Ædile?

(8. Mention the dates of the capture of Rome by the Gauls, the capture of Saguntum by the Carthaginians, the battle of Cannæ, the invasion of Italy by Pyrrhus, the destruction of Carthage.

SECTION IV.

(1.) Give an account of the Social War.

(2.) Write a character of Marius. To what political party did he belong? and what appears to have been the aim of his policy, as far as he had any?

(3.) Write a short life of Cicero. Describe particularly his mode of dealing with the conspiracy of Catiline.

(4.) What distinction was made at the time of Augustus between provinces governed by the authority of the Emperor and those governed by the authority of the Senate?

(5.) What were the chief privileges of a Roman citizen?

(6.) At what time did the Romans begin to form a navy? Mention the most important naval battles in Roman history.

(7.) At what dates and by what means did the Romans become possessed of Sicily, Spain, Peloponnesus, Egypt.

(8.) What offices did Augustus unite in his own person and for what purpose?

FRENCH.

THREE HOURS ALLOWED.

I.

Translate into English *any two and not more than two*, of the following extracts; and answer (in French, if possible) the questions respectively appended to each of those two extracts.

(1.) From Corneille's *Le Cid.* (Acte II, Scène 2) :—

D. Rodrigue.
Parle sans t'émouvoir.
Je suis jeune, il est vrai; mais aux âmes bien nées
La valeur n'attend pas le nombre des années.

D. Gomès.
Te mesurer à moi! Qui t'a rendu si vain,
Toi qu'on n'a jamais vu les armes à la main?

D. Rodrigue.
Mes pareils à deux fois ne se font pas connaître,
Et pour leurs coups d'essai veulent des coups de maître.

D. Gomès.
Sais tu bien qui je suis?

D. Rodrigue.
Oui; tout autre que moi
Au seul bruit de ton nom pourrait trembler d'effroi.
Les palmes dont je vois ta tête si couverte
Semblent porter écrit le destin de ma perte.
J'attaque en téméraire un bras toujours vainqueur;
Mais j'aurai trop de force, ayant assez de cœur.
A qui venge son père il n'est rien d'impossible;
Ton bras est invaincu, mais non pas invincible.

D. Gomès.
Ce grand cœur qui paraît aux discours que tu tiens
Par tes yeux, chaque jour, se découvrait aux miens;
Et, croyant voir en toi l'honneur de la Castille,
Mon âme avec plaisir te destinait ma fille.
Je sais ta passion, et suis ravi de voir
Que tous ses mouvements cèdent à ton devoir,
Qu'ils n'ont point affaibli cette ardeur magnanime,
Que ta haute vertu répond à mon estime;
Et que, voulant pour gendre un cavalier parfait,
Je ne me trompais pas au choix que j'avais fait.
Mais je sens que pour toi ma pitié s'intéresse;
J'admire ton courage, et je plains ta jeunesse;
Ne cherche point à faire un coup d'essai fatal;
Dispense ma valeur d'un combat inégal.
Trop peu d'honneur pour moi suivrait cette victoire:
A vaincre sans péril, on triomphe sans gloire.
On te croirait toujours abattu sans effort,
Et j'aurais seulement le regret de ta mort.

D. Rodrigue.
D'une indigne pitié ton audace est suivie:
Qui m'ose ôter l'honneur craint de m'ôter la vie!

* * * * * * * *

D. Gomès.
Viens, tu fais ton devoir; et le fils dégénère
Qui survit un moment à l'honneur de son père.

a. Give a biographical sketch of P. Corneille, with the names of his principal plays.

b. Explain briefly the plot of *Le Cid.*

(2.) From Voltaire's *Siècle de Louis XIV.* (Chap. XVII.):—

Guillaume III laissa la réputation d'un grand politique, quoiqu'il n'eût point été populaire, et d'un général à craindre, quoiqu'il eût perdu beaucoup de batailles. Toujours mesuré dans sa conduite, et jamais vif que dans un jour de combat, il ne régna paisiblement en Angleterre que parcequ'il ne voulut pas y être absolu. On l'appelait, comme on sait, le Stathouder des Anglais, et le Roi des Hollandais. . . . Son caractère était en tout l'opposé de Louis XIV.: sombre, retiré, sévère, sec, silencieux, autant que Louis était affable. . . .

Ceux qui estiment plus le mérite d'avoir défendu sa patrie, et l'avantage d'avoir acquis un royaume sans aucun droit de la nature, de s'y être maintenu sans être aimé, d'avoir gouverné souverainement la Hollande sans la subjuguer, d'avoir été l'âme et le chef de la moitié de l'Europe, d'avoir eu les ressources d'un général et la valeur d'un soldat, de n'avoir jamais persécuté personne pour la religion, d'avoir méprisé toutes les superstitions des hommes, d'avoir été simple et modeste dans ses mœurs; ceux-là sans doute donneront le nom de grand à Guillaume plutôt qu'à Louis. Ceux qui sont plus touchés des plaisirs et de l'éclat d'une cour brillante, de la magnificence, de la protection donnée aux arts, du zèle pour le bien public, de la passion pour la gloire, du talent de régner; qui sont plus frappés de cette hauteur avec laquelle des ministres et des généraux ont ajouté des provinces à la France sur un ordre de leur roi; qui s'étonnent davantage d'avoir vu un seul Etat résister à tant de puissances; ceux qui estiment plus un roi de France qui sait donner l'Espagne à son petit fils, qu'un gendre qui détrône son beau-père; enfin ceux qui admirent davantage le protecteur que le persécuteur du roi Jacques, ceux-là donneront à Louis XIV la préférence.

a. State what you know of the life and works of Voltaire, and what you think of the influence of his writings on his age and country.

b. What portion of history does the *Siècle de Louis XIV* embrace, and in how many distinct periods may it be divided?

(3.) From Montesquieu's *Grandeur et Décadence des Romains*, (Chap. 1):—

Rome était dans une guerre éternelle et toujours violente: or, une nation toujours en guerre, et par principe de gouvernement, devait nécessairement périr, ou venir à bout de toutes les autres, qui, tantôt en guerre, tantôt en paix, n'etaient jamais si propres à attaquer, ni si préparées à se défendre. Par là, les Romains acquirent une profonde connaissance de l'art militaire. Dans les guerres passagères, la plupart des exemples sont perdus; la paix donne d'autres idées, et on oublie ses fautes et ses vertus mêmes.

Une autre suite de ce principe de la guerre continuelle fut que les Romains ne firent jamais la paix que vainqueurs: en effet, à quoi bon faire une paix honteuse avec un peuple pour en aller attaquer un autre?

Dans cette idée, ils augmentaient toujours leurs prétentions à mesure de leurs défaites: par là ils consternaient les vainqueurs, et s'imposaient à eux-mêmes une plus grande nécessité de vaincre.

Toujours exposés aux plus affreuses vengeances, la constance et la valeur leur devinrent nécessaires; et ces vertus ne purent être distinguées chez eux de l'amour de soi-même de sa famille, de sa patrie, et de tout ce qu'il y a de plus cher parmi les hommes.

Les peuples d'Italie n'avaient aucun usage des machines propres à faire les siéges; et, de plus, les soldats n'ayant point de paye, on ne pouvait pas les retenir long-temps devant une place: ainsi peu de leurs guerres étaient décisives. On se battait pour avoir le pillage du camp ennemi ou de ses terres; après quoi le vainqueur et le vaincu se retiraient, chacun dans sa ville. C'est ce qui fit la résistance des peuples d'Italie, et en même temps l'opiniâtreté des Romains à les subjuguer; c'est ce qui donna à ceux-ci des victoires qui ne les corrompirent pas, et qui leur laissèrent toute leur pauvreté.

a. Give a biographical sketch of Montesquieu. Name his principal works.

b. State briefly what Montesquieu considers to be the most important causes of the decline of Rome.

(4.) From de Tocqueville's *L'Ancien Régime et la Révolution* (Chap. I.):—

Imaginez-vous, je vous prie, le paysan français du dix-huitième siècle, ou plutôt celui que vous connaissez; car c'est toujours le même: sa condition a changé, mais non son humeur. Voyez-le tel que les documents que j'ai cités l'ont dépeint, si passionnément épris de la terre qu'il consacre à l'acheter toutes ses épargnes et l'achète à tout prix. Pour l'acquérir il lui faut d'abord payer un droit, non au gouvernement, mais à d'autres propriétaires du voisinage, aussi étrangers que lui à l'administration des

affaires publiques, presque aussi impuissants que lui. Il le possède enfin : il y enterre son cœur avec son grain. Ce petit coin du sol qui lui appartient en propre dans ce vaste univers le remplit d'orgueil et d'indépendance. Surviennent pourtant les mêmes voisins qui l'arrachent à son champ et l'obligent à venir travailler ailleurs sans salaire. Veut-il défenbre sa semence contre leur gibier; les mêmes l'en empêchent, les mêmes l'attendent au passage de la rivière pour lui demander un droit de péage. Il les retrouve au marché, où ils lui vendent le droit de vendre ses propres denrées; et quand rentré au logis, il veut employer à son usage le reste de son blé, de ce blé qui a crû sous ses yeux et par ses mains, il ne peut le faire qu'après l'avoir envoyé moudre dans le moulin et cuire dans le four de ces mêmes hommes. C'est à leur faire des rentes que passe une partie du revenu de son petit domaine, et ces rentes sont imprescriptibles et irrachetables.

Quoi qu'il fasse, il rencontre partout sur son chemin ces voisins incommodes, pour troubler son plaisir, gêner son travail, manger ses produits; et, quand il a fini avec ceux-ci, d'autres, vêtus de noir, se présentent, qui lui prennent le plus clair de sa récolte. Figurez-vous la condition, les besoins, le caractère, les passions de cet homme, et calculez, si vous le pouvez, les trésors de haine et d'envie qui se sont amassés dans son cœur.

a. State what you know of the late M. de Tocqueville's career. What is his great work, besides *L'Ancien Régime et la Révolution ?*

b. Name briefly the principal causes to which M. de Tocqueville ascribes the Revolution of 1789.

II.

1. Mention briefly, with dates, the most important events of the reign of Louis IX.

2. Sketch in French the most striking features of the character and administration of Richelieu.

III.

Write a letter in French, of about fifteen lines, upon any subject you please, with as many idiomatic expressions as possible.

GERMAN.

THREE HOURS ALLOWED.

Section I.

Translate from German into English.

Each candidate is expected to translate one of the following passages, and to answer a few of the grammatical questions appended to to the first.

(1). Friedrich bedurfte keiner langen Vorbereitung, um sich, zur Erwerbung seines Rechtes, auf einen kriegerischen Fusz zu setzen. Sein Plan ward nur wenigen Vertrauten mitgetheilt. Aber die ungewöhnlichen Bewegungen, die auch zu dieser Vorbereitung nöthig waren, die Truppenmärsche, Artilleriezüge, die Einrichtung der Magazine und dergleichen gaben es kund, dasz irgend ein groszes Unternehmen im Werke war. Alles ward von Staunen und von Neugier erfüllt; die verschiedensten Gerüchte brachte man in Umlauf; die Diplomaten sandten und empfingen Couriere, ohne mit Bestimmtheit den Plan des Königs errathen zu können. Absichtlich hatte dieser einige Truppenmärsche so angeordnet, dasz man vorerst eher an eine Rhein-Campagne, wegen Jülich und Berg, als an Schlesien dachte. Die verkehrtesten Meinungen, die im Publikum herüber und hinüber wogten, ergötzen ihn sehr. "Schreib mir viel Possierliches," so hiesz es in einem Briefe Friedrich's an Jordan, "was man sagt, was man denkt, und was man thut."

Grammatical Questions.

(*a.*) Give the infinitives, past participles, and present indicative of *bedurfte*, *gaben*, *brachte*, *sandten*, and *empfingen.*

(*b.*) State the difference of meaning of *setzen* and *sitzen;* also of *stehen* and *stellen*, *legen* and *liegen*, *sinken* and *senken*, *ertrinken* and *ertränken;* and mention the irregularities belonging to some of these verbs.

(*c.*) Why is *einen kriegrischen Fusz* not in the dative? State the rule which governs this preposition as to its cases, and mention the other prepositions which come under the same rule.

(*d.*) Give the nominative and genitive singular of *Bewegungen*, *Truppenmärsche*, *Artilleriezüge* and *Gerüchte.*

(*e.*) Give the infinitive, the present, imperfect, and imperative of *mitgetheilt.*

(*f.*) Give the genitive case of all the personal pronouns.

(*g.* Why is *war*, in the third sentence, at the end?

(*h.*) Why is the nom. *dieser*, in the fifth sentence, after the verb?

2. Ist mein Gewissen gegen diesen Staat
Gebunden? Hab'ich Pflichten gegen England?
Ein heilig Zwangsrecht ûb' ish aus, da ich
Aus diesen Banden strebe, Macht mit Macht
Abwende, alle Staaten dieses Welttheils
Zu meinem Schutz aufrühre und bewege.
Was irgend nur in einem guten Krieg
Recht ist und ritterlich, das darf ich üben.
Den Mord allein, die heimlich blut'ge That
Verbietet mir mein Stolz und mein Gewissen;
Mord würde mich befleken und entehren.
Entehren, sag'ich—keinesweges mich
Verdammen, einem Rechtsspruch unterwerfen.
Denn nicht vom Rechte, von Gewalt allein
Ist zwischen mir und Engelland die Rede.

Section II.

Translation from English into German. Not more than ten of the following passages are to be translated by each candidate. The answers are to be written in English or German character, but as distinctly as possible.

1. He dined with me at my hotel.
2. He has never dined with us (viz., at our house).
3. She trembled with cold.
4. With such a noise, I cannot hear.
5. Will you take this letter with you for me?
6. Sit down and play for me.
7. I never play at cards for money.
8. What do you use this machine for?
9. I do not know what it is used for.
10. Why did you allow this trifling dispute to come a law-suit?
11. I did not let it come to it. It was brought to it by my attorney.
12. Not having any interest in it myself, I left it entirely to him, relying on his good sense, knowledge of the law, and integrity.

(13.) I am just having a book printed which I wrote last year, while I was travelling on the Continent.

(14.) I remember, you were engaged upon it, when I met you at Milan, on my way to the East.

(15.) When it is finished, I shall have much pleasure in sending you a copy of it.

(16.) Why do you copy this?

(17.) It is so indistinctly written, that I am afraid I shall have to copy nearly the whole work before I send it to the printer.

18. The opinions of men are not always the same.

19. If human opinions were always the same, and the same in all men; and if it were indifferent to men what opinions others entertain, there would not be so many divisions, quarrels, and wars in the world.

(20.) It had been determined by the father that, in case one of the brothers should, after his death, leave the paternal house, he who went away should receive half the property which had accumulated in the family within a century.

(21.) If he had been an only son, his right of inheritance would not have been doubtful a moment.

(22.) He did not wish to make a difference among his sons, and therefore would not allow the right of primogeniture which prevails in noble families to have sway in his.

(23.) He used plausible arguments to prove his right.

MUSIC.

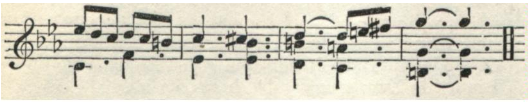
THREE HOURS ALLOWED.

Rudiments of Musical Grammar.

(1.) Can the scale or key of a piece of music be *always* known from the signature?

(2.) In how many ways can the *upper* tetrachord of a minor scale be written?

(3.) In what scale or key does the following passage begin and end?



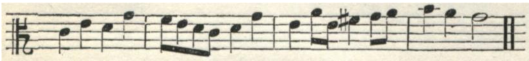
(4.) Does the presence of an accidental *always* imply modulation?

(5.) How many kinds of time essentially different from one another are there?

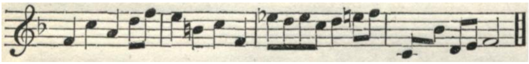
(6.) How does 6/8 time resemble, and how does it differ from, 3/4 time?

(7.) Explain the following terms:—Mode, interval, accent, tetrachord, accidental, crescendo, signature.

(8.) Write the following passage on the treble stave.



(9.) Transpose the following into the scale or key of *Re* (D).



(10.) Write any melody with which you are acquainted, from memory.

Harmony.

(1.) Give examples of contrary, oblique, and similar motion.

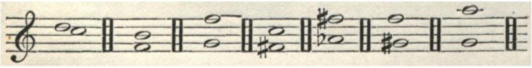
(2.) How does a discord by suspension differ from a fundamental discord?

(3.) How many kinds of *triad* are there?

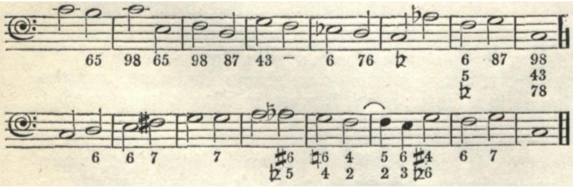
(4.) How many kinds of fundamental discord of the Seventh are there?

(5.) Of what intervals is the discord of the *dominant* Seventh composed? and why is so much importance attached to it by modern musicians?

(6.) Resolve the following intervals:—

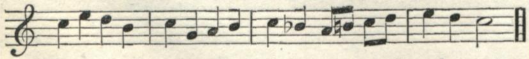


(7.) Add three parts to one or both of the following basses:—

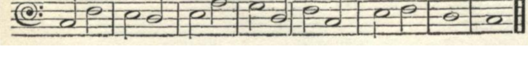


(8.) Give any rules or general principles for the succession of fundamental basses.

(9.) Put a bass to the following:—



(10.) Add one or more parts, in any species of counterpoint, to the following:—



THE *BOMBYX CYNTHIA*, OR *RICINUS* SILKWORM.

The following is the substance of a German pamphlet,* containing a report laid before a general meeting of the Acclimatisation Society of Prussia, on the 22nd of last October, by Herr Ernst Kauffmann, a vice-president of of the Society, on the recently-introduced *Bombyx Cynthia*,† or silkworm of the *Ricinus*. Having introduced the subject by a few prefatory sentences on the silk-producing insects, and the beauty of the fabrics derived from the labours of those diminutive creatures, the author enters into a concise statement of the different metamorphoses through which the common silkworm (*Bombyx Mori*) passes during its brief period of existence, tracing it from the egg (which he describes minutely as containing a yolk, white, &c., analogous to those of our domestic fowl), through the larva state, its several moultings or changes of skin, which in this stage occur five times, and which changes or moults frequently occasion serious losses to the breeder,—until it arrives at the pupa state, in which alone it becomes of utility to man; the perfect insect, after leaving the protection of the chrysalis, living only to continue the species. These details being sufficiently well-known, their repetition *in extenso* is unnecessary. It may, however, be as well to recall a fact, that it is seldom that more than one breed of the *Bombyx Mori* can be successfully reared in a season. Further south, indeed, the mulberry, if prudently divested of its leaves, will reproduce a quantity of foliage sufficient to supply a second brood with advantage; but in more northern latitudes, where nature is less favourable to vegetation, a profitable after-crop is scarcely to be expected, there being no available substitute on failure of the mulberry-leaf, and the cultivator must, therefore, be content with one brood of eggs only, of which every healthy female lays from four to five hundred.

The number of eggs laid by the *Bombyx Cynthia* seldom exceeds 300, but as the insect goes through the whole series of changes in about six weeks, it is possible to obtain, in the course of the year, no less than eight or nine broods from a single pair.

Let us now, says the author of the report, make an approximate estimate of the enormous quantity of cocoons to be derived from this single pair in so short a space of time—supposing their offspring to be supplied with the requisite amount of food and all necessary attention paid to them. It will not be found in practice—and on a large scale—that from every egg laid a cocoon will be produced. The common silk-worm loses, on an average, in each brood, from one-fourth to one-third of the original number. Let us assume the highest of these as the proportion for the *Ricinus* silkworm (although this latter is much the more healthy) and by making the deduction at the outset, the calculations will be simplified.

This deduction leaves one hundred couples as the first produce of the original pair. Proceeding in this manner with the calculation, it will be found that at the end of the year the descendants of this pair will reach to no less a number than ten thousand million million couples—and that the eggs of these latter will amount to the enormous sum of two million million million.

"Here," says the author of the report, "breath absolutely fails me, and I am happy to have done at length with enumerating the posterity of these two moths."

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* The title of the work at full length is as under:—"A Comparison between the Growth of Ricinus and Mulberry Silk, as regards their respective products; with remarks on some new Silk-producing Caterpillars. Being a Report delivered on the 22nd October, 1858, before a public meeting of the Prussian Acclimatisation Society. By Herr Ernst Kauffmann, Vice-President of the Society. Reprinted from the Society's Journal, at the express command of His Highness the Duke of Saxe Coburg Gotha."

† Communications in reference to the *Bombyx Cynthia* will be found in the *Journal*, Vol. vi., pp. 168, 460, 630, 641.

The author calculates that 3,300 empty cocoons are amply sufficient to yield one pound of silk—but he assumes that 4,000 would be required—and this would give 500 billion pounds of silk as the entire product of one couple. Assuming the population of Germany at 45 millions, this calculation at the year's end would allow more than ten million pounds to each individual; and many a poor wretch, who now shivers in the winter's cold, would have reason to be grateful to the first pair of moths for a warm and comfortable protection against the inclemency of the season.

In making this statement the author desires not to be misunderstood; he states his aim in bringing before the Society his moderate estimate of the prolific powers of the *Bombyx Cynthia*, to be simply to show how liberal in this, as well as in other instances, nature is of her favours, and in no way to maintain either the possibility or the expediency of rearing such an enormous number; for neither land nor labour could be spared to furnish the immense supply of vegetable matter which would be required for that purpose.

The silk-rearer, however, is at liberty either to discontinue his operations at the second or third generation, or to confine them to such a limited and determinate number as he may either find most profitable or convenient—the preceding figures being merely intended to show what is within the bounds of possibility.

The author then proceeds to make an estimate of the comparative value of the cocoon from the two species of silkworm:—

On examining one of the reddish-yellow, almond-shaped cocoons, of the *Bombyx Cynthia*, it will be seen that the insect, while preparing a convenient receptacle for its period of repose, has provided itself with a place of exit; the empty cocoons being scarcely distinguishable from those still containing a chrysalis, except by their comparative lightness.

With the cocoons of the *Bombyx Mori* the case is different, these being entirely closed—the escape of their inmates being effected by means specially provided for that purpose, but destructive of the cocoon. The insect must, therefore, be destroyed in order to save the silk. Such is not the case with the *Bombyx Cynthia*. The cocoons may be recognised by their oval figure, and by that even brilliant thread which is capable of being readily reeled off.

The process is somewhat more difficult with the cocoons of the *Bombyx-Pernyi*, or silkworm of the oak. The aid of chemistry must be called in to remove a tough, glutinous substance, with which the threads are, as it were, cemented. The reeling is, however, rendered possible.

The case is the same with the huge cocoons (still attached to the twigs on which they were spun) of the *Bombyx-Cecropia*, which feeds on the leaves of the weeping birch. In the spring of the year 1858, Herr Hensel received direct from America a parcel of cocoons of different species, from which the splendid moths exhibited by the author to the meeting were produced. It is to be regretted that, in this instance, more accurate observations were not made on this species—a neglect which, on a future occasion, care will be taken to remedy.

Very favourable results have been obtained in France from a smaller portion of this, the most important sample of these cocoons which has hitherto reached Europe. This large cocoon does not however consist entirely of fine silk. On cutting one open, a loose web is first met with, which, as well as the external covering, admits of being carded. Underneath this appears a kernel, as it were, of an almond shape, consisting of silk, evidently capable of being wound off. Until the present time, owing to the rarity of the cocoons in Europe, this operation has not taken place. The first attempt of the kind then laid before the meeting, would enable it to form an opinion of the quality of the threads. They are uncommonly thick and strong, but the cocoons do not seem to yield so large a proportion as do those of the *B. Pernyi* to which, in many respects, they have a great similarity. The latter, as the meeting might perceive from the samples exhibited, yield a material of very fair quality. Both kinds have, however, but an inferior gloss, not at all to be compared with the brilliant lustre which confers such value on the silk of the *B. Mori*. The dull cloth made from these cocoons, as well as from those of the *Ricinus* cocoons, has no pretensions to vie with those splendid fabrics woven from the mulberry silk. As an article of luxury in dress, the latter will always be certain to command the admiration and preference of the public. But goods will ere long be produced from *Ricinus* silk, in which the desirable quality of moderation in price will, doubtless, recommend them to the favour of economic housewives.

In order to arrive at its value in a commercial point of view, the expenses of an ordinary silk crop must be taken as a basis for the estimate. Suppose that the time of one man is required on an average to attend to the produce of each ounce of eggs. The cocoons from an ounce will, on this assumption, cost,—

1 man 45 days	12	Thalers.
8 cwt. of Mulberry leaves	8	„
Fuel, rent of buildings, wear and and tear of utensils, &c.	1	„
	21	

This estimate is rather above the mark than below it. By the returns from these cocoons the rearer expects not only to cover his expenses, but also to receive a surplus, which, in case he devotes his own attention to the business, may amount to about as much. The chief outlay of capital, however, is for buildings, plantations, &c., and is made with the expectation of their being required only for a few weeks in each season.

With the cultivator of the *Ricinus* silk it is far different. While the former must be content with one brood in a year, the latter can have from eight to twelve, if he will only adhere to the directions already given by the author in a previous treatise; and, granting that the expenses in each case are alike, the cultivator in the latter case is in a position to turn his capital some eight or twelve times as often, and is, of course, able to afford his article at a more reasonable rate. There will also be a comparative diminution of all outgoings, owing to there being no loss from intermission, to the management being less expensive, and to the very low value of the food. From all these circumstances, it will be apparent that the Ricinus silk must claim to be ranked among the cheapest of the textile substances; that it never can be dear will be plain from the fact that carding is found to be the most eligible mode of treating the cocoons, from which, in all cases, the moths may all be allowed to come forth, whilst the breeder looks for his profit to the quantity rather than the quality.

It is impossible at present to form a precise estimate of the saving that would accrue to Germany, supposing the cultivation of the *Ricinus* silk should ever become general, but it may fairly be assumed that the enormous sums now annually paid to America for cotton must be very considerably diminished.

Professor Dieterici, President of the Society, observes, in one of his statistical publications:—"Cotton fabrics are daily assuming more importance, and superseding, or, at least, entering into serious rivalry with, those of linen, the chief reason for which is the continually augmenting production of the raw material."

The same reason will, the author is convinced, ere long cause the *Ricinus* silk to come into general use. America, Asia, and Africa produce annually nearly four million bales (3 to 4 hundred pounds each) of cotton; and this in a continuously increasing ratio. Of this by far the largest proportion is worked up in Europe—chiefly in England—which requires a weekly supply, amounting in value to one and a half to two million dollars. Dieterici estimates the value of the cotton yarn manufactured in England and Scotland, in the year 1853, at nearly one hundred and sixty-five million dollars. In the Zollverein this manufacture is yet far from being on so extensive a scale, but it is gradually and steadily progressing, as is plain from the fact that on the average of the years 1849-1853, the importation of raw cotton had risen 136 per cent. above that of 1837; while that of foreign yarns had only increased about 35 per cent. above that of the same year.

The author then proceeding in his calculations, shows that a sum of thirty-three million thalers is annually expended within the Zollverein upon cotton manufactures; and admitting that a large portion of this must be placed to the account of labour, still half, or more, remains to that of the raw article, and he speculates on the benefit that would arise, should Germany produce the quantity of the raw article which he is sanguine enough to anticipate. Prussia would no longer be compelled to send so considerable an amount of its coin across the water—it would remain at home. A domestic production would compete with, and supersede cotton in part, with no detriment to the manufacturing interest; on the contrary, the existing cotton factories—the machinery in which might readily be adapted to suit the exigences of the new manufacture—would receive a fresh impulse, the processes being so comparatively easy, and the consumption of the fabrics being continually on the increase, and in these benefits he seems confident that the whole of western Europe would also partake. He next adverts to the enhanced value of mulberry silk, which he attributes to various causes; to the expense of renewing the mulberry plantations, to the ravages caused by the diseases prevalent during the past ten years among the worms in the silk-producing districts of Europe; to the costly manipulations of the cocoons; and also to the influence of that "absurd tyrant, fashion, who apparently, at times, takes a delight in disfiguring beauty itself, and at whose behest, the ladies, for the last few years, have been compelled to assume a double allowance both of silk and of space, and we may deem ourselves fortunate if we are enabled, by the extended production of domestic silk, to keep pace with the increasing amplitude of skirts."

The efforts made by the Great Frederick to introduce the cultivation of silk in Prussia are next adverted to. He appropriated 16,000 thalers a-year for its encouragement, and caused the requisite buildings and machinery to be erected, by the advice of his minister, Count Herzberg. Unfortunately, however, the proper steps were not taken to ensure any permanent benefit to the country from these establishments, and they were eventually discontinued. Some splendid mulberry trees alone remain (among other existing memorials of that remarkable man), but for which, the silk culture in Prussia would still be in abeyance; since upon the leaves of these trees were fed the first silkworms, which, after a long interval, were again introduced into Prussia.

The re-introduction took place in 1824, through the agency of Bolzani, the well-known virtuoso, the first brood having been reared within the precincts of the "Invaliden-Haus." Since that date, thanks to the prudent regulation of the ministry, the number of mulberry plantations, and, together with them, the produce of native silk, has been considerably on the increase—the Society for Encouraging the Growth of Silk having contributed zealously thereto. Much, however, notwithstanding the earnest exertions of Count Arnim, and the present Minister of the Interior, Herr Flottwell, still remains to be done, and the author reiterates his oft-repeated hopes, that the government will not relax in its endeavours to foster this important branch of industry, and that the further extension of mulberry plantations may be encouraged by all the means at their command.

After some further observations, more especially interesting to his own countrymen, and the members of the Society he was addressing, the author proceeds to compliment the latter, through whose means the rearing of the *Ricinus* silkworm, since its introduction by him in 1856, has been extended not only over Prussia, but also into the rest of Germany, and even into Sweden and Russia, with the most promising results. From the silk produced by these worms, he continues, were manufactured the fabrics laid before the meeting. They cannot, it is true, compete in beauty with those from mulberry silk; but he hopes, before long, to be able to submit to the Society specimens which need not shrink from meeting even this test of comparison—the requisite experiments being even now in course of operation, and the machinery brought to a state of higher perfection.

There is not the shadow of a doubt with regard to its practical value as a strong and durable material. Equally well adapted for fine, and at the same time serviceable articles of clothing, for stuffs for the use of the upholsterer, for coarse sail and tent cloths, it will speedily come into almost universal demand. And the author feels assured, on competent authority, that it will prove of great utility in the fabrication of cartridges for the artillery, and will obviate many mischances that occur at present from careless and hasty loading. But he would rather see it applied to more peaceful uses, and hopes it may one day be his lot to see the labourer following the plough in a silken smock-frock—the product of his own industry—an aspiration that will, he thinks, one day be realised; it is grounded on the easy and economical rearing of the worm and its remarkable powers of increase; a little attention during a few of the summer months to a light and easy occupation being enough to produce material sufficient to clothe a whole family for a length of time.

The author then alludes briefly to the plants on which these silkworms feed. An acre of the *Ricinus*, at its full growth, is found to be amply sufficient to feed a quarter of a million caterpillars. The quantity of leaves, which, without detriment to the plants, may be obtained from an equal space of ground planted with teasels, depends, as far as past experience enables him to judge, upon the stage of growth at which the plants have arrived. Shortly before the buds reach maturity, when the foliage is in full vigour, at least the one-half may be removed. In order to decide this point, the author intends to cause further trials to be made in various localities, how far the *Bombyx Cynthia* may be fed with success on these leaves. He announced the fact in a publication of February (last year), and distributed at the same time to his fellow members of the Society seeds of the teasel, accompanied with eggs of the insect. Further experience has tended to confirm his views in this respect, the worms exhibited to the meeting being the fifth and sixth generation fed exclusively on the leaves of the teasel. Neither cocoons, moths, nor larvæ, exhibited the slightest difference from those fed entirely on leaves of the *Ricinus*.

The objection is thus obviated, that the breeding of these silkworms in northern climates will necessitate fresh plantations annually, of a shrub which is indigenous only in the south, the *Ricinus* in Prussia seldom ripening its seeds, and not surviving through the winter months without protection. The native cultivation of the teasel yields a clear profit, varying from 25 to 100 thalers per acre (morgen). Since the plant has many large leaves and stems of great length, there is thus, in addition to the crop of heads, a large amount of vegetable matter, which may be fixed at 14 to 15 cwt. per acre, dry weight, but which at present only serves to augment the manure heap. But supposing that, over and above the acknowledged returns from the teasel crop, an additional profit may be derived from a portion that would otherwise go to waste, it will serve to give a stimulus to a branch of agricultural industry which the Prussian Government has sought to encourage for the past eight years.

After a few statistical details of the teasel culture, and the importation of the heads into the Zollverein, which he states from Dieterici to be annually on the increase, and regretting the difficulty of acclimatisation and domestication in the case of the larger animals, which prevents the objects of the Society from being better appreciated, he concludes his report by expressing a hope that he said enough to satisfy the most incredulous, and to prove the beneficial tendency of their labours, not only to their countrymen, but to the world at large.

REPORT ON RAILWAYS FOR 1858.

The report of Captain D. Galton, Royal Engineers, on the proceedings of the Board of Trade relating to railways for the year 1858, has been published as a blue-book. It adduces the following facts:—In the session of 1858, 113 Railway Bills came before Parliament, and the length of new line proposed by these bills was 698. But only 73 of the Bills were passed, and 328 miles of new line only authorized. In 1857, 82 Acts were passed, authorizing 663 miles of new line; in 1856, 59; and in 1855, 73. The amount of money authorized to be raised last year for new lines and new works was £6,834,705, against £10,336,413 in 1857, £5.784,426 in 1856, £9,192,038 in 1855, £9,211,602 in 1854, £15,517,601 in 1843, £4,333,834 in 1852, £9,553,275 in 1851, and £4,115,632 in 1850. The gross total sum authorized to be raised in the 13 years from 1846 to 1858 (both inclusive) amounted to £265,142,590. In 1846 alone, the period of the great railway mania, £132,617,368 was authorised to be raised for the construction of 4,538 miles of railway. The total amount of money authorized to be raised by railway companies by shares and on loan to the end of 1858 was £392,682,755, of which £325,375,507 had been raised, leaving £67,307,248 to be raised. There are no means of ascertaining how much of this sum appertains to the portions of railway for which the Parliamentary powers have expired. 15,659 miles constituted the total length of line authorized down to the end of 1858; but 1,610 miles have been abandoned; 9,506 miles of line were open at the end of last year, and 4,543 miles (duly authorized) remained to be opened. 6,976 were open on the 31st of December last in England, 1,342 in Scotland, and 1,188 in Ireland. The narrow gauge is quite in the ascendant, seeing that, of the 9,542 miles of line open, 6,352 miles were narrow gauge, 749 only broad gauge, 261 mixed gauge, and 1,180 "Irish" gauge. Of single lines, there were 2,088 miles of narrow, 255 of broad, 52 of mixed, and 753 of "Irish" gauge. Of 426 miles of new line opened in 1858, 372 were laid with only one line of rails. 880 miles of new line were reported to be in course of construction on the 30th of June, 1858, and of these 219 miles were opened before the last day of the year. 38,546 persons, an average of 43·79 per mile, were employed on the 30th of June, 1858, upon the lines in course of construction. The length of line open for traffic in the United Kingdom on the 30th of June, 1858, was 9,323 miles, and the number of persons employed thereon amounted to 109,329 persons, or 11·72 per mile.

£325,375,507 was the total amount raised for railways on the 31st of December, 1858, representing an expenditure of £34,243 per mile of railway open. It is assumed that on an average 6 per cent. of that expenditure has been for Parliamentary and legal expenses, 18 for land and compensation, 66 for works, and 10 for rolling stock.

It is worthy of notice that, although the cost of railways in the United Kingdom has averaged £34,243 per mile—viz., £38,779 in England, £27,532 in Scotland, and £15,061 in Ireland—the average cost of lines of railway for which Acts have been obtained since 1848, and which are now opened for traffic, has amounted to £10,500 per mile—viz., £12,600 per mile in England, £8,700 per mile in Scotland, and £6,600 per mile in Ireland. Of the total amount of money raised, £81,683,179 has been raised by loans, £61,854,547 by preference shares, and the remainder—viz., £181,837,781—by ordinary share capital.

The average rate of dividend on the whole of the ordinary share capital in railways invested was 3·06 last year against 3·60 in 1857, and 3·40 in 1856. It has always been 3 and a decimal since 1852; in that year it was 2·40; in 1851, 2·44; in 1850, 1·83; and in 1849, 1·88. The average interest on the preference capital and loan was 4·63 last year; it ranged at 4 and a decimal from 1851 to 1858; in 1850 it was 5·00, and in 1849, 4·94. The per centage of the gross receipts (less working expenses) to the total amount of capital and loan has ranged from 2·83 to 4·06. It was 3·75 last year. "It may be assumed," says Captain Galton, "that so long as the proportion of the net receipts to the capital expended increases in each year the property is in a sound condition." Last year, however, the net receipts unfortunately exhibited a decrease.

The proportion of passenger traffic to the whole traffic was 43 per cent. in England, 36 in Scotland, and 57 in Ireland. 139,193,699 persons were conveyed by railways last year, against 139,008,888 in 1857. The receipts from passengers amounted to £10,376,309, against £10,592,798 in 1857. The receipts from goods, cattle, minerals, parcels, &c., in 1858 amounted to £13,580,440, against £13,581,812 in 1857, which represents £1,458 per mile in 1858, compared with £1,524 per mile in 1857. The total receipts from goods, cattle, minerals, parcels, &c., may be divided as follows, viz.:—£7,711,350 was for the conveyance of 25,593,996 tons of merchandise, £4,046,061 was for the conveyance of 48,396,501 tons of minerals, £501,398 for the conveyance of 11,206,110 heads of live stock, and 1,321,631 for the conveyance of parcels, &c. Although there has been on the whole an increase in the receipts for goods, minerals, live stock, &c., in 1858 over 1857, the stagnation in trade caused by the panic had a perceptible effect upon the receipts of the year ended the 31st of December, 1858; in this year there was a diminution of £70,393 in the receipts on account of general merchandise as compared with the receipts of the year ended the 31st of December, 1857; this occurred entirely in England and Scotland. The traffic in live stock also showed a decrease of £22,350 in England and £1,097 in Scotland, which was reduced in the general total to £15,960 by an increase of £7,487 in Ireland. The total receipts from all sources of traffic have amounted in England and Wales to £20,244,095 or £2,939 per mile in 1858 against £20,527,748, or £3,105 per mile in 1857; in Scotland to £2,536,933 or £1,949 per mile in 1858, against £2,501,478, or £2,040 per mile in 1857; and in Ireland to £1,175,721, or £1,041 per mile in 1858 against £1,145,384, or £1,076 per mile in 1857. The aggregate receipts from all sources of traffic for the whole kingdom having been £23,956,749, or £2,572 per mile in 1858, against £24,174,610, or £2,715 per mile in 1857. Of the 140,000,000 passengers (in round numbers) conveyed last year 18,302,384 were first class, 41,693,289 second class, 79,145,464 third class and Parliamentary, and 52,562 holders of annual or season tickets. The other "live-stock" included 2,323,305 head of cattle, 6,938,160 sheep, and 2,048,619 pigs.

The general results of the traffic in 1858 exhibited by these figures are undoubtedly unsatisfactory, inasmuch as, while the length of railway in the United Kingdom has increased by above 400 miles, the receipts were actually less in 1858 than in 1857 by £217,861, and the working expenses averaged 49 per cent. of the receipts, instead of 47 per cent., as was the case in 1857. On some of the principal railway companies, however, the traffic has materially improved.

From the tables it appears that 1 passenger in 5,353,603 has been killed, and 1 in 332,204 been injured from causes beyond their own control during the year 1858. The proportion of killed and injured from similar causes to the number who travelled was 1 in 312,794.

A select committee of the House sat last year upon the subject of railway accidents, and after a careful consideration of the question they were of opinion that the responsibility of the management should be left with the railway companies, and that interference by the Government is, as a general rule, not desirable. As a contrast to the system of leaving the responsibility of management on the companies, Captain Galton has appended a translation of the regulations imposed on the companies by the Government, drawn up by a commission of inquiry into the safety of railway travelling in France, from which it will be seen how close the interference by the Government in railway management is in that country. "A careful study of these regulations appears to show that interference in the details of railway management is scarcely possible, unless the interference be carried throughout the whole system."

"There can be no doubt," he adds "that the true interests of railway companies are nearly identical with those of the public, both in respect of safety and convenience in railway travelling, and it is to be hoped that each year the railway companies will be led more and more to understand this, and, that while doing their utmost to accommodate the public, they will increase their dividends by improved management, and avoid that reckless competition by which so large an amount of money has hitherto been annually wasted."

A NEW LONG RANGE CANNON.

A wonderful long range cannon, invented by Mr. Jeffries, patentee of the well-known marine glue, is in course of being mounted in the Royal Arsenal, Woolwich, for experiments at Shoeburyness. The gun, with its present bore, namely, a three-inch diameter, weighs seven tons, and presents an appearance (with the exception of the present calibre) similar to one of our 68-pounders. The charge will consist of 16lb. of powder, and a conically-shaped shot, weighted with lead to 9lb., and hollowed similarly to the Minié bullet, which it is presumed will be propelled fifteen or twenty miles. Mr. Jeffries, it is stated, has asserted his conviction that it would carry from Dover to Calais. It is the intention of the authorities to carry out a varied and complicated course of experiments under the inspection of the Select Committee of Woolwich Arsenal. After being satisfied of its power in its present form, the bore will be progressively increased to a 68-pounder. To enable the gunners to point the gun, the trunnions will be fitted with a couple of telescopes, to assist the eye over the enormous range predicted.

NEW SHIP'S WINDLASS.

Lately, a number of gentlemen assembled by invitation on board a new ship lying in the East India Dock, and belonging to the Messrs. Green, to inspect and observe in operation a patent ship's windlass, which it is thought will produce most important results as regards the mercantile marine. The vessel herself is a valuable addition to the already noble fleet of the celebrated owners. She is named "the Newcastle," and is of 1,200 tons burden. The patent windlass exhibited on this occasion was originally an American invention, and is stated to have been applied very successfully to a number of vessels on the other side of the Atlantic; and, considerable alterations having been made in this country to improve and strengthen it, Messrs. Emmerson and Walker, the patentees of the invention in its new form, now submit it to the judgment of experience. It may be added that the Newcastle is not the only vessel which will soon afford an opportunity of working it; Messrs. Somes Brothers' new ships at Dundee and Glasgow are also being provided with it. The peculiarity of this windlass consists in its being a combination of the capstan and windlass, and in an ingenious arrangement of the parts, by which either a very heavy purchase, or a quick motion may be had at will, simply by turning the capstan round, with the sun in the one case, and in the other against it. The two ends of the windlass which take the chain can either or both be placed in connection with the capstan, and the result is that one chain only or two at one time can be worked with equal facility. The chains, it is stated, require no fleeting, but are drawn directly from the lockers, are not liable to surge, and can be paid out, checked, or stopped, at any moment, by one man at the break. The windlass is simple in its construction, and so compact that in the Newcastle it occupies only a space of seven feet six inches by four feet six inches. Combined with the windlass were seen Wardill's patent chain compressors or stoppers, by means of which one man will, it is anticipated, always be able to keep the cable under perfect control. During the visit paid to her the Newcastle's anchor was lifted, and the economy of labour was shown by the fact that 12 men, or about half the usual number of hands for an anchor of the same dimensions, were sufficient for the operation, the saving in time being far more than proportionate to that in labour. The importance of the invention in this point of view is enhanced, so far at least as the Newcastle is concerned, by the vessel's being provided with Cunningham's patent topsails—an invention which substitutes for the tedious and dangerous operation of reefing by hand a self-acting process of great simplicity and rapidity. The difficult operations of lifting and lowering the anchor, and of reefing topsails, have hitherto necessitated the employment of a much larger crew than were necessary for the ordinary duties of seamanship, and hence if these two inventions shall receive the sanction of nautical experience, they may possibly lead to a reconsideration of the number of hands which each vessel shall be compelled to have in proportion to the tonnage. Even if the legislature should consider any reduction of the number undesirable, on account of the many unforeseen emergencies of sea-life, that can be no reason for not adopting or encouraging the aids of mechanical invention, or for retaining slow and cumbrous processes in place of rapid and simple ones. As the Newcastle will shortly sail for India, the merits of the new windlass, in practice, will no doubt ere long be duly reported upon by her officers.

NEW PROCESS FOR WATERING STREETS.

An experiment is now being tried at Lyons, for laying the dust in public promenades, and it is stated to have been so far successful. A chemist of that city having accidentally spilt some hydrochloric acid on a terrace of his, found that it hardened the spot on which it had fallen, and maintained it in a state of permanent moisture. This led him to think that by watering the streets with this acid the dust on large macadamised roads might be laid, or rather prevented from rising. Experiments were first made on the Cours Napoleon, between the Rhone and the Perrache station. The success is said to have been complete, the carriage-way having now been several months free from dust; and another experiment is now being made on the Place Bellecour. During the hottest part of the day, the ground, although dry and gravelly, has the appearance of being as consistent and damp as if it had been watered half an hour before. But as evening approaches the moisture becomes more and more perceptible, and every morning the ground is stiffer, and more comfortable to walk on. This may be easily accounted for; the acid decomposing the gravel or stone, forms one or several deliquescent salts, which therefore attract the moisture of the air. The question as to whether roads thus watered are likely to last so long as they ought, can only be decided by time.

Home Correspondence.

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WATER GLASS.

SIR,—The very interesting and important documents that have appeared lately in the *Journal* on the subject of water-glass (soluble silicate of potash or soda) and its application to render porous stones impermeable, together with the fact that almost all our common building stones decay rapidly on exposure to the atmosphere of large towns, render it exceedingly desirable that the buildings in France, said to have been successfully treated with the fluid silicate of potash or soda alone, should be subjected to careful examination by disinterested persons.

It would, indeed, appear that the same process has failed on that portion of the river front of the Houses of Parliament on which it was tried last year. It is, therefore, the more important that we should know whether there is such a difference in the climate of London and Paris as to account for this different result, or whether the difference, if it exists, is due to the quality and nature of the stone.

The practical results that must follow on the ultimate decision of this question are so important that either some public body, or the Government itself ought to secure an impartial report at as early a period as possible, so that the rapidly advancing decay in a large proportion of our public buildings may be checked.

I am, &c., D. T. ANSTED.

Guernsey, Aug. 22, 1859.

THE WESTMINSTER CLOCK.

SIR,—I entirely agree with the ideas put forth by your correspondent E. T. Loseby on this subject, for the following reasons:—

A great work, intended to be an example of magnitude and accuracy to the nations, should never have been submitted to a lowest tender. The unfortunate result has amply proved the great impropriety of such a course; and it is more than probable that, like the first bell, it will in the end be condemned and replaced by a second Westminster clock.

I know nothing of the designer or the maker, but this I know, that I would not have confided the construction of such a colossal piece of machinery even to the first watchmaker in the world, because the mind and hands constantly employed upon the beautiful works of pocket watches and chronometers, are ill calculated for a work of such magnitude. First-rate engine manufacturers are the parties who should have been entrusted with the execution, under the surveillance of a mixed jury of practical and scientific gentlemen. Their accuracy of workmanship and gearing would put Mr. Denison's rude and clumsy machine quite out of countenance. They would use tempered steel in the prominent parts, and the whole would be either polished or bronzed.

Your correspondent is perfectly correct in his decision that Graham's dead beat, improved or modified, would be the only escapement to be depended upon with certainty in a work of such importance, as it should be observed that all high towers are subject to a diurnal vibratory movement, depending upon the heat of the sun, which contracts the side exposed to its rays, and causes the tower to bend in that direction, to return again to its normal position in the cool of the night. In regard to the improvements suggested, I scarcely think that Mr. Loseby goes far enough, as he does not allude to the great propriety of making the clock self-winding, that is to say, that the driving weights should be suspended by the well-known double clock-line, or other suitable contrivance, so as to be continually hoisted by the power of a small steam engine, or, perhaps, still more conveniently by a water pressure engine, with, of course, the usual precautions against over or under winding, in which case no maintaining power would be required.

The difficulty of the minute hand, so much affected by stong winds, may be readily overcome, as it is only the extreme point that is required to indicate time, while all the rest might be completely protected by a disc, supported by overreaching brackets across the lines of figures, not visible from the ground.

I have had the opportunity of witnessing the construction of a large church clock, made by a common but intelligent country clockmaker, which certainly did not vary more than one second per day. But the wheels were alternately wrought iron and brass, the teeth being formed out of the solid by means of cutting and finishing engines of his own invention and make. The clock carries a two-second pendulum, and the price charged, set up and guaranteed, would be deemed fabulously small indeed in this country.

I shall be curious to see your correspondent's second letter upon the great Westminster bell, upon which I may have something to say, as bell founding and hanging is a subject with which I have some little practical acquaintance. I am, &c.,

HENRY W. REVELEY.

WOOD WASTE.

SIR,—While passing through the lakes of Cumberland I visited some of the wood-turning establishments which are so numerous round Windermere. As the mills are worked by water-power, the waste wood cannot be consumed as fuel, as in mills where steam power is employed; I inquired what became of the refuse, and learned that is was partly carted away to the cottagers, who pay a trifling sum, hardly sufficient for the carriage, and the remainder burnt to ashes and thrown into the watercourse.

The wood used consists chiefly of well-seasoned birch, sycamore, and small ash. The quantity consumed within a few miles of Windermere lake is about fifteen thousand tons a year, four-fifths of which, or twelve thousand tons, become either sawdust or shavings.

It occurred to me that this might be turned to better account, and that perhaps it only requires publicity among your scientific readers to remedy such an enormous waste. I am, Sir, your obedient servant,

JAS. W. CARLILE.

Thickholms, near Huddersfield.

PATENT LAW AMENDMENT ACT.

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APPLICATIONS FOR PATENTS AND PROTECTION ALLOWED.

[*From Gazette, August* 26*th*, 1859.]

Dated 13*th August*, 1859.

1871. R. Clegg, Islington, and R. Fell, St. Ann's-place, Limehouse—Apparatus for obtaining aerated fresh water from salt water.

1872. J. Stuart and W. Stuart, Musselburgh, Mid Lothian, N.B.—Imp. in nets for fishing, and for other purposes.

1873. K. Buhring, 45, Saint Paul's-road, Camden-town—An imp. in obtaining spring power, and in its application to various purposes.

1874. R. I. Watts, J. Offord, and J. R. Thomas, Plymouth—A method of condensing and consuming smoke, and other products of coals, ores, and similar substances, and reducing them to useful materials.

1875. H. T. Lambert, America-square, London—Improved apparatus to be adapted to ships' tackle or boats, for the purpose of facilitating the disengaging of ships' boats when lowered into the water. (A com.)

1876. E. Sloman, Upper East Smithfield—An improved feed water and heating apparatus. (A com.)

1877. J. R. Rostron, Edenfield, Lancashire—Imp. in locomotive furnaces.

1878. C. Mather, Salford—Imp. in machinery for stretching, drying, and finishing fabrics.

Dated 15*th August*, 1859.

1879. S. Harrison, 52, Stanhope-street, Clare-market—Broiling of chops or any other kind of meat.

1880. J. Jeyes, Northampton—An imp. in the manufacture of boots and shoes.

1881. C. Kisky, King-street, Camden Town, and W. Jones, Howland-street, Fitzroy-square—Imp. in the construction of sideboards.

1882. C. Glassborow, Girard-avenue, Philadelpha, U. S.—Imp. in pianos.
1833. J. Chanter, Bow-road, and D. Annan, Bow, Middlesex—Imp. in apparatus for supplying air to furnaces.
1884. E. Stone, 46, Lime-street—Imp. in machinery for cutting veneers. (A com.)
1885. J. Poupard, Stratford, Essex—A certain plastic combination to be used for black-leading stoves and other ironwork.

Dated August 16th, 1859.

1887. H. Batchelor, Newport, Monmouthshire—Imp. in steam and other motive power engines.
1889. W. Gossage, Widnes, Lancashire—Imp. in the treatment of certain offensive liquids and of noxious gases liberated from such liquids.
1890. J. C. Haddan, Bessborough Gardens, Pimlico—Imp. in wads for projectiles, and in projectiles to be used therewith.
1891. J. C. Haddan, Bessborough Gardens, Pimlico—Imp. in machinery or apparatus for rifling cannon.

Dated 17th August, 1859.

1893. H. Medlock, 15 and 20, Great Marlborough-street, Westminster—Imp. in Portland and Roman cement, lime, and other similar kilns or furnaces.
1895. R. A. Brooman, 166, Fleet-street—Imp. in locks and keys. (A com.)
1897. A. Yockney, Pockeredge, near Chippenham, Wiltshire—Imp. in refining and compounding oils or fatty matters with other substances for lubricating and other purposes.

Dated 18th August, 1859.

1899. J. Drabble, Orchard Works, Orchard-lane, Sheffield--An imp. in sewing machines.
1901. H. J. Hyams, Holywell-street, Westminster—Imp. in the construction of wet gas meters.
1903, W. Wilson, Glasgow—Imp. in the manufacture or production of bricks, tiles, and other articles of earthenware, and in the machinery or apparatus employed therein.

[*From Gazette, September 2nd*, 1859.]

Dated 12th July, 1859.

1654. T. Wright, 9, George-yard, Lombard-street—Imp. in the permanent way of railways, and in the means of preventing railway accidents thereon.

Dated 30th July, 1859.

1770. H. J. Newcome, Shenley, near Barnet, Hertfordshire—An apparatus for heating or warming buildings.

Dated 1st August, 1859.

1782. E. de Bassano, Brussels—Imp. in the manufacture of artificial fuel, commonly called patent fuel.

Dated 5th August, 1859.

1802. B. Tweedy, Utrecht, Netherlands—An improved mode of and apparatus for consuming smoke in locomotive and other engine furnaces, whereby coal can be used instead of coke.

Dated 6th August, 1859.

1812. W. R. Drake, 46, Parliament-street, Westminster—An apparatus for conducting electricity in the sea, and for telegraphing and sounding in deep water. (A com.)

Dated 9th August, 1859.

1848. J. Waite, Cheltenham—Imp. in making infusions for pharmaceutical purposes, which improvements are also applicable to other purposes of a similar nature.

Dated 11th August, 1859.

1856. W. White, 34, North Audley-street, Grosvenor-square—A four-wheeled safety sociable carriage.

Dated 16th August, 1859.

1888. J. H. G. Rex, Regent's Quadrant—Imp. in the construction of dwelling-houses or other buildings, for the purpose of facilitating the escape of the inmates in case of fire.

Dated 17th August, 1859.

1892. J. Sidebottom, Waterside, Derbyshire—Certain imp. in power looms for weaving.
1896. S. Beardmore, 27, Albion-street, Hyde-park—Imp. in electric batteries.

Dated 18th August, 1859.

1898. W. Grimshaw, Lower Broughton, near Manchester, and S. Mason, jun., Manchester—Imp. in machinery and apparatus employed in washing, bowking, bleaching, and preparing flax, and other substances.
1900. A. J. Canu, Paris—Imp. in machines for breaking or crushing stones, minerals, or other similar materials.

Dated 19th August, 1859.

1904. P. Salmon, Glasgow—Imp. in locomotives, and in apparatus for warming trains of carriages connected thereto.
1905. W. T. Henley, St. John-street-road, Clerkenwell—Imp. in machinery for the manufacture of ropes and cables, and for paying out and picking up submarine telegraph cables.
1906. S. Boult, Liverpool—Imp. in the means of, or apparatus for retarding railway carriages.
1907. J. Jackson and J. Thorley, Worsley, Lancashire—Imp. in hoists for raising and lowering weights.
1908. J. Fowler, jun., R. Burton, and D. Greig, jun., Cornhill, E. E. Allen, Park Side, Knightsbridge, and W. Worby, Ipswich—Imp. in ploughs, cultivators, or tilling inplements, and in machinery for giving motion to the same by steam power.
1909. H. W. Harman, Manchester—Imp. in steam boilers, and in working the same, and in safety valves, and apparatus connected therewith.

Dated 22nd August, 1859.

1911. E. Hardon, Stockport—Certain imp. in looms for weaving.
1912. W. Finegan, Belfast—Imp. in apparatus for lubricating machinery.
1913. D. Grant, Edinburgh—Imp. in wet gas meters.
1914. G. W. Petter and T. D. Galpin, Belle Sauvage-yard, Ludgate-hill—Imp. in printing presses.
1915. W. A. Vérel, Macduff, Banff—Imp. in the preparation of bones for manure.
1916. R. A. Brooman, 166, Fleet street—Imp. in apparatus for preparing and spinning fibrous materials. (A com.)
1917. J. J. O. Taylor, Mark Lane—An imp. in the separation of silex and silicious matter from iron.
1918. Captain H. Spratt, R.M., Plymouth—Imp. in revolving pistols and other fire-arms.
1919. Hon. W. Talbot, Army and Navy Club, Pall Mall—An improved cigar lighter.
1920. H. Parkes, Birmingham—Imp. in the manufacture of cylinders, and tubular or hollow bodies of copper, and alloys of copper or other ductile metals.
1921. E. Abbott, Brunswick-square, Middlesex—Imp. in ordnance and fire-arms.
1922. O. Maggs, Bourton, Dorset—Imp. in taps, cocks, or valves.
1923. R. S. Harvey, Lincoln—Imp. in apparatus for dusting vines, hops, and other plants and trees with sulphur, and other powder.

Dated 23rd August, 1859.

1925. P. F. C. de la Salle, Nice, Italy—A new method of arranging the keys on the fingerboards of pianos, organs, and other similar instruments.
1927. T. Fry, Liverpool—The application of enamelled slate to the new purpose of lining, panelling, or otherwise facing the internal or external walls of houses, public buildings, and edifices generally.
1929. O. Maggs, Bourton, Dorset—Imp. in apparatus for weaving straw, rushes, and other materials into fabrics.

WEEKLY LIST OF PATENTS SEALED.

[*From Gazette, September 2nd*, 1859.]

August 31st.

441. S. T. Cooper.
546. J. T. Carter.
553. J. W. Harker and J. K. Field.
554. E. Roche.
560. H. Brown.
566. J. D. Dougall.
573. C. F. Dennet.
576. R. A. Brooman.
579. J. M. Dunlop.
582. F. W. Parker.
588. R. Leake and M. Sykes.
592. W. Palmer.
594. W. Gossage.
595. J. Aspinall.
599. J. L. Jullion and G. Pirie.
601. A. Booth, sen., and A. Booth, jun.
603. G. Twigg.
610. J. A. Williams.
612. J. R. Nicholson.
626. R. Hellard.
645. C. H. Hurst.
654. W. Clark.
657. W. Robertson and J. G. Orchar.
706. W. C. Cambridge.
709. W. Hudson and C. Catlow.
721. W. A. Gilbee.
754. H. Rigby.
780. W. Mossman.
800. A. V. Newton.
818. W. E. Newton.
830. A. Paget.
935. J. Luis.
993. J. Wotton.
1060. J. Holroyd.
1410. F. Puls.
1420. F. A. T. De Beauregard.
1497. R. Smith.
1521. R. Hornsby.
1561. L. L. Tower.
1598. J. H. Nalder and T. Nalder.

PATENTS ON WHICH THE STAMP DUTY OF £50 HAS BEEN PAID.

[*From Gazette, September 2nd*, 1859.]

August 29th.

2016. J. Blake and F. Maxwell.
2037. J. Apperly.
2047. E. P. Spiller.

August 31st.

2038. P. J. Guyet.

[*From Gazette, September* 6, 1859.]

September 1st.

2068. W. S. Mitchell and C. M. E. Gartner.
2076. S. W. Park & E. S. Ellis.

September 2nd.

2054. E. Leigh and G. P. Leigh.
2070. R. Wilson.

September 3rd.

2062. B. O. Stratford, Earl of Aldborough.
2064. J. B. Dancer.

LIST OF DESIGNS FOR ARTICLES OF UTILITY REGISTERED.

No. in the Register.	Date of Registration.	Title.	Proprietors' Name.	Address.
4195	Aug. 19	Candlestick	Joseph Caddick	Birmingham.
4196	,, 23	A Shoe or Boot Maker's Last Stand	William Keates	High-street, Cheadle, Staffordshire.
4197	,, 24	A Fastening for Pocket Books, Purses, Portmonnaies, and other similar articles	Thomas De la Rue and Co.	Bunhill row, E.C.
4198	,, 27	Cartridge Case Drawer, for Breech-loading Fire Arms	Henry Elliott	Birmingham.
4199	,, 30	The Colonial Belted Trowsers	Fenwick Brothers	71 and 72 High-street, Gravesend.